

THERMASGARD® ESTF

(D) Bedienungs- und Montageanleitung

Einschraubtemperaturfühler/Tauchtemperaturfühler,
mit passivem Ausgang

(GB) Operating Instructions, Mounting & Installation

Screw-in temperature sensors / immersion temperature
sensors with passive output

(F) Notice d'instruction

Sonde de température à visser/à plongeur,
avec sortie passive

(RU) Руководство по монтажу и обслуживанию

Датчик температуры ввинчиваемый/погружной,
с пассивным выходом

ESTF



S+S REGELTECHNIK

S+S REGELTECHNIK GMBH
PIRNAER STRASSE 20
90411 NÜRNBERG / GERMANY

FON +49 (0) 911 / 5 19 47-0
FAX +49 (0) 911 / 5 19 47-70

mail@SplusS.de
www.SplusS.de



Herzlichen Glückwunsch!

Sie haben ein deutsches Qualitätsprodukt erworben.

Congratulations!

You have bought a German quality product.

Félicitations!

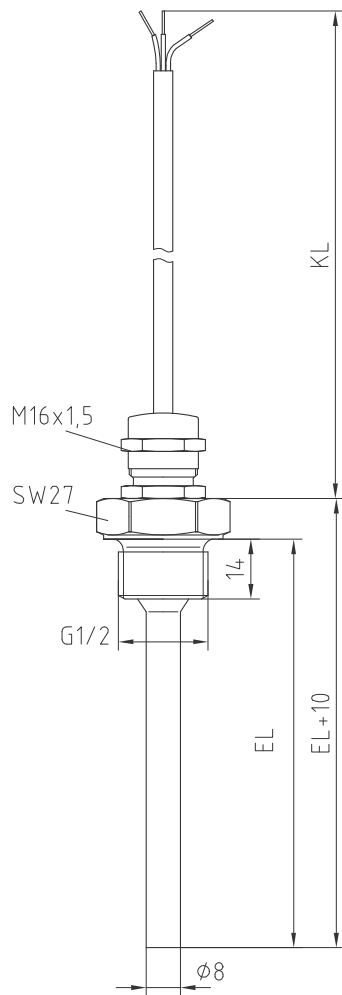
Vous avez fait l'acquisition d'un produit allemand de qualité.

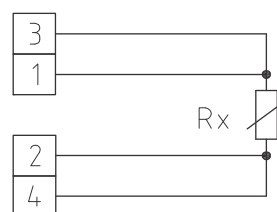
Примите наши поздравления!

Вы приобрели качественный продукт, изготовленный в Германии.

Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

ESTF





Type/WG1 - Sensor/Output Features	50 mm PVC	50 mm Silicone	100 mm PVC	100 mm Silicone
ESTF Pt100	●	●	●	●
ESTF Pt1000	●	●	●	●
ESTF Ni1000	●	●	●	●
ESTF Ni1000 TK5000, LG-Ni1000	●	●	●	●
ESTF NTC 1,8 kOhm	●	●	●	●
ESTF KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	●	●	●	●
ESTF LM235Z (TCR = 10mV/K), KP10	●	●	●	●
Extra charge:	2-wire connecting leads, PVC, per running meter 2-wire connecting leads, silicone, per running meter			

GB General notes

Measuring principle of HVAC temperature sensors in general:

The measuring principle of temperature sensors is based on an internal sensor that outputs a temperature-dependent resistance signal. The type of the internal sensor determines the output signal. The following active/passive temperature sensors are distinguished:

- a) Pt 100 measuring resistor (according to DIN EN 60 751)
- b) Pt 1000 measuring resistor (according to DIN EN 60751)
- c) Ni 1000 measuring resistor (according to DIN EN 43 760, TCR = 6180 ppm/K)
- d) Ni 1000_TK 5000 measuring resistor (TCR = 5000 ppm/K)
- e) LM235Z, semiconductor IC (10 mV/K, 2.73 V/°C). Ensure correct polarity + /- when connecting!
- f) NTC (according to DIN 44070)
- g) PTC
- h) KTY silicon temperature sensors

The most important resistance characteristics are shown on the last page of these operating instructions. According to their characteristics, individual temperature sensors exhibit different slopes in the range between 0 °C and 100 °C (TK value). Maximum-possible measuring ranges also vary from sensor to sensor (for some examples to this see under technical data).

Note!

Select immersion depth for built-in sensors so that the error caused by heat dissipation stays within the admissible error margins. A standard value is: 10 x diameter of protection tube + sensor length. In connection with enclosure-type sensors, particularly with outdoor sensors, please consider the influence of thermal radiation. For that purpose, a sunshade and radiation protector SS-02 can be attached.

Maximum thermal load on components:

On principle, all temperature sensors shall be protected against unacceptable overheating!

Standard values for individual components and materials selected are shown for operation under neutral atmosphere and otherwise normal conditions (see table to the right).

For combinations of different insulating materials, the lowest temperature limit shall always apply.

Component	max. thermal load
Connecting head type B:	
Aluminium casting with rubber seal.....	+100 °C
Aluminium casting with silicone seal.....	+150 °C
"VA" stainless steel part with Teflon seal	+200 °C
Connecting head made of plastic:	
Connecting cable.....	+100 °C
PVC, normal (PVC, heat-stabilized)	+70 °C (+105 °C)
Silicone	+180 °C
PTFE.....	+200 °C
Fibreglass insulation with stainless steel texture.....	+400 °C

GB Resistance characteristics of passive temperature sensors (see last page)

In order to avoid damages/errors, preferably shielded cables are to be used.
Laying measuring cables parallel with current-carrying cables must in any case be avoided. EMC directives shall be observed!
These instruments must be installed by authorised specialists only!

Limiting deviation according to classes:

Tolerances at 0 °C:

Platinum sensors (Pt100, Pt1000):

DIN EN 60751, class B.....	± 0.3 K
1/3 DIN EN 60751, class B.....	± 0.1 K

Nickel sensors:

NI1000 DIN EN 43760, class B.....	± 0.4 K
NI1000 1/2 DIN EN 43760, class B.....	± 0.2 K
NI1000 TK5000.....	± 0.4 K

ATTENTION, NOTE!

Testing current influences the thermometer's measuring accuracy due to intrinsic heating and therefore, should never be greater than as specified below:

Standard values for testing current:

Sensor current, maximum	I _{max.}
Pt100, Pt1000 (thin-layer)	<0.1-0.3 mA
Ni1000 (DIN), Ni1000 TK5000.....	<2 mA
NTC's	<1 mA
LM235.....	400 µA... 5 mA

GB Mounting and Installation

Devices are to be connected under dead-voltage condition. Devices must only be connected to safety extra-low voltage. Consequential damages caused by a fault in this device are excluded from warranty or liability. Installation of these devices must only be realized by authorized qualified personnel. The technical data and connecting conditions shown on the device labels and in the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products. In case of any modifications made by the user, all warranty claims are forfeited. Operating this device close to other devices that do not comply with EMC directives may influence functionality. This device must not be used for monitoring applications, which solely serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes. Dimensions of enclosures or enclosure accessories may show slight tolerances on the specifications provided in these instructions. Modifications of these records are not permitted. In case of a complaint, only complete devices returned in original packing will be accepted.

Notes regarding mechanical mounting and attachment:

Mounting shall take place while observing all relevant regulations and standards applicable for the place of measurement (e.g. such as welding instructions, etc.). Particularly the following shall be regarded:

- VDE/VDI directive technical temperature measurements, measurement set-up for temperature measurements.
- The EMC directives must be adhered to.
- It is imperative to avoid parallel laying of current-carrying lines.
- We recommend to use shielded cables with the shielding being attached at one side to the DDC/PLC.

Before mounting, make sure that the existing thermometer's technical parameters comply with the actual conditions at the place of utilization, in particular in respect of:

- Measuring range
- Permissible maximum pressure, flow velocity
- Installation length, tube dimensions
- Oscillations, vibrations, shocks are to be avoided (< 0.5 g)

INFORMATION FOR PLANNING AND INSTALLATION

Permissible approach velocities (flow rates) for crosswise approached protective tubes in water.

The protective tube is caused to vibrate by the approaching flow.

If the specified approach velocity is exceeded even by a marginal amount, a negative influence on the lifetime of the protective tube may result (material fatigue).

Please observe the permissible approach velocities for stainless steel protective tubes (see diagram TH-VA) as well as for brass protective tubes (see diagram TH-ms).

Gas discharges and pressure surge must be avoided as such have negative influence on lifetime or damage protective tubes.

Attention! In any case, please observe the mechanical and thermal load limits of protective tubes according to DIN 43763 respectively according to specific S+S standards!

Notes regarding process connection of built-in sensors:

If possible, select material of protective tube to match the material of piping or tank wall, in which the thermometer will be installed!

Maximum temperatures $T_{\max}$ and maximum pressures $p_{\max}$ are as follows: for TH-MS brass sleeves $T_{\max} = +150^{\circ}\text{C}$, $p_{\max} = 10$ bar and for TH-VA stainless steel sleeves (standard) $T_{\max} = +400^{\circ}\text{C}$, $p_{\max} = 40$ bar.

Screw-in threads:

Ensure appropriate support of the gasket or sealing material when mounting! Permissible tightening torque standard values for screw-in threads, are as follows:

M 18 x 1.5; M 20 x 1.5, pipe thread G 1/2" : 50 Nm

M 27 x 2.0, pipe thread G 3/4" : 100 Nm

Flange mounting:

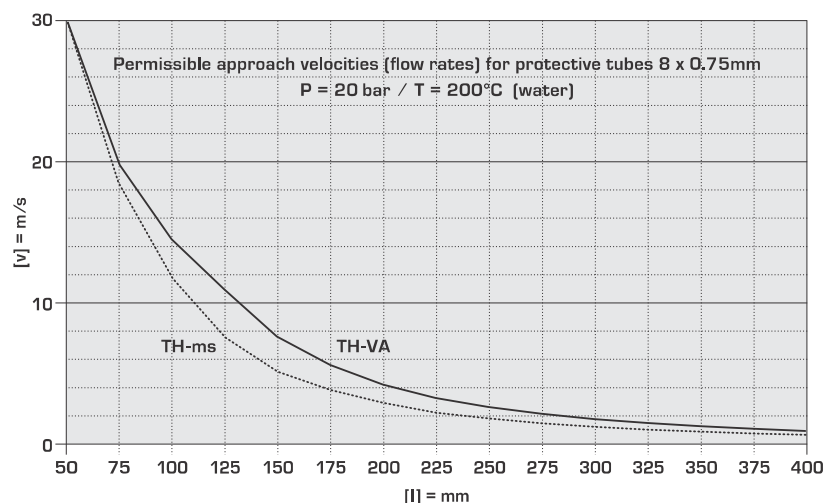
In case of flange mounting, screws in the flange part must be equally tightened. The lateral pressure screw must clamp securely, otherwise the feeler shaft might slip through.

Welding sleeves:

Specific welding instructions shall be observed.

On principle, unevenness or the like that might influence the system's "CIP ability" must not develop at welds.

For high-pressure lines, pressure test certifications and inspections are required.



Temp. °C	Pt100 Ω	Pt1000 Ω	Ni1000 Ω	Ni1000 TK5000 Ω	FeT Ω	KTY 81-210 kΩ	LM 235Z mV	Temp. °C
-50,0	80,31	803,10	743,00	790,88	-	1 068,65	2 232,00	-50,0
-40,0	84,27	842,70	791,00	830,83	-	1 158,95	2 332,00	-40,0
-30,0	88,22	882,20	842,00	871,69	1 934,70	1 269,25	2 432,00	-30,0
-20,0	92,16	921,60	893,00	913,48	2 030,41	1 385,15	2 532,00	-20,0
-10,0	96,09	960,90	946,00	956,24	2 127,68	1 508,65	2 632,00	-10,0
0,0	100,00	1 000,00	1 000,00	1 000,00	2 226,53	1 639,60	2 732,00	0,0
10,0	103,90	1 039,00	1 056,00	1 044,79	2 327,01	1 778,10	2 832,00	10,0
20,0	107,79	1 077,90	1 112,00	1 090,65	2 429,15	1 924,15	2 932,00	20,0
25,0	109,74	1 097,40	1 141,00	1 113,99	2 480,86	2 000,00	2 982,00	25,0
30,0	111,67	1 116,70	1 171,00	1 137,61	2 533,00	2 077,80	3 032,00	30,0
40,0	115,54	1 155,40	1 230,00	1 185,71	2 638,60	2 238,90	3 132,00	40,0
50,0	119,40	1 194,00	1 291,00	1 234,97	2 745,99	2 407,60	3 232,00	50,0
60,0	123,24	1 232,40	1 353,00	1 285,44	2 855,23	2 583,80	3 332,00	60,0
70,0	127,07	1 270,00	1 417,00	1 337,14	2 966,36	2 767,50	3 432,00	70,0
80,0	130,89	1 308,90	1 483,00	1 390,12	3 079,42	2 958,80	3 532,00	80,0
90,0	134,70	1 347,00	1 549,00	1 444,39	3 194,47	3 152,50	3 632,00	90,0
100,0	138,50	1 385,00	1 618,00	1 500,00	3 311,56	3 363,90	3 732,00	100,0
110,0	142,29	1 422,00	1 688,00	1 556,98	3 430,75	3 577,75	3 832,00	110,0
120,0	146,06	1 460,60	1 760,00	1 615,36	3 552,09	3 799,10	3 932,00	120,0
130,0	149,82	1 498,20	1 883,00	1 675,18	3 675,65	4 028,05	4 032,00	130,0
140,0	153,58	1 535,80	1 909,00	1 736,47	3 801,48	4 188,10	4 132,00	140,0
150,0	157,31	1 573,10	1 987,00	1 799,26	3 929,65	4 397,70	4 232,00	150,0

Temp. °C	NTC 1 kΩhm Ω	NTC 1,8 kΩhm Ω	NTC 3 kΩhm Ω	NTC 5 kΩhm Ω	NTC 10 kΩhm kΩ	NTC 10 k PRE kΩ	NTC 20 kΩhm kΩ	NTC 50 kΩhm kΩ
-50,0	32 886,00	-	200 338,00	333 914,00	667,83	441,30	1 667,57	4 168,93
-40,0	18 641,00	-	100 701,00	167 835,00	335,67	239,80	813,44	2 033,61
-30,0	10 961,00	-	53 005,00	88 342,00	176,68	135,20	415,48	1 038,70
-20,0	6 662,00	-	29 092,00	48 487,00	96,97	78,91	221,30	553,24
-10,0	4 175,00	8 400,00	16 589,00	27 649,00	55,30	47,54	122,47	306,18
0,0	2 961,00	5 200,00	9 795,20	16 325,40	32,65	29,49	70,20	175,51
10,0	1 781,00	3 330,00	5 971,12	9 951,80	19,90	18,79	41,56	103,90
20,0	1 205,00	2 200,00	3 748,10	6 246,80	12,49	12,26	25,35	63,49
25,0	1 000,00	1 800,00	3 000,00	5 000,00	10,00	10,00	20,00	50,00
30,0	834,20	1 480,00	2 416,80	4 028,00	8,06	8,19	15,89	39,71
40,0	589,20	1 040,00	1 597,50	2 662,40	5,32	5,59	10,21	25,53
50,0	424,00	740,00	1 080,30	1 800,49	3,60	3,89	6,72	16,80
60,0	310,40	540,00	746,12	1 243,53	2,49	2,76	4,52	11,30
70,0	231,00	402,00	525,49	875,81	1,75	1,99	3,10	7,75
80,0	174,50	306,00	376,85	628,09	1,26	1,46	2,12	5,42
90,0	133,60	240,00	274,83	458,06	0,92	1,08	1,54	3,85
100,0	103,70	187,00	203,59	339,32	0,68	0,82	1,12	2,79
110,0	81,40	149,00	153,03	255,03	0,51	0,62	0,82	2,05
120,0	64,70	118,00	116,58	194,30	0,39	0,48	0,61	1,52
130,0	51,90	95,00	89,95	149,91	0,30	0,38	0,46	1,15
140,0	42,10	77,00	70,22	117,04	0,23	0,30	0,35	0,88
150,0	34,40	64,00	55,44	92,39	0,18	0,24	0,27	0,68